IN THE CLAIMS

Claims 1-10 and 12-20 are hereby amended as set forth below. No new claims have been added. All pending claims and their present status are produced below:

1.   (currently amended)   [[An]] A computer based optimization method of optimizing one of a model, structure, shape and design representing a physical object based on an evolution strategy, comprising the steps of :

describing one of [[a]] the model, structure, shape and design representing the physical object to be optimized using a parameter set comprising object parameters;

creating offsprings of the parameter set by modifying the object parameters, wherein said modifying includes at least one of mutating the object parameters and recombining the object parameters;

evaluating [[the]] quality of the offsprings;

wherein the parameter set comprises at least one strategy parameter representing a step-size of the mutation of associated object parameters; and

adapting [[the]] a number of the object parameters and [[the]] a number of associated strategy parameters during optimization.

2.   (currently amended)   The optimization method of claim 1 further comprising the step of: altering the object parameters and the strategy parameters, wherein said altering includes at least one of selectively inserting and removing an object parameters parameter and a strategy parameters parameter. , and selectively removing object parameters and strategy parameters.

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3. (currently amended) The optimization method of claim 2, further comprising ~~the step of:~~ estimating [[the]] a value of a newly inserted strategy parameter based on [[the]] information of strategy parameters associated with correlated object parameters.

4. (currently amended) The optimization method of claim 1, further comprising ~~the step of:~~ estimating [[the]] a value of a newly inserted strategy parameter based on [[the]] information of strategy parameters associated with correlated object parameters.

5. (currently amended) The optimization method of claim 1, further comprising ~~the step of:~~ determining a position of ~~said~~ altering ~~of said~~ an object parameter and an associated strategy parameter using a random function.

6. (currently amended) The optimization method of claim 5, further comprising ~~the step of:~~ determining a time of ~~said~~ altering ~~of said~~ the object parameter and the associated strategy parameter using a random function.

7. (currently amended) The optimization method of claim 1, further comprising ~~the step of:~~ determining a time of ~~said~~ altering ~~of said~~ an object parameter and an associated strategy parameter using a random function.

8.   (currently amended)   The optimization method of claim 1, further comprising ~~the step of:~~ determining a position of ~~said~~ altering ~~of said~~ an object parameter and an associated strategy parameter by [[the]] progress of the evolutionary optimization.

9.   (currently amended)   The optimization method of claim 8, further comprising ~~the step of:~~ determining a time of said altering of said object parameter and the associated strategy parameter by the progress of the evolutionary optimization.

10.   (currently amended)   The optimization method of claim 8, further comprising ~~the step of:~~ determining a time of said altering of said object parameter and [[an]] the associated strategy parameter by the progress of the evolutionary optimization.

11.   (original)   The optimization method of claim 1, wherein the mutating of the object parameters does not directly influence the result of the evaluating step.

12.   (currently amended)   [[An]] A computer based ~~optimization~~ method of optimizing one of a model, structure, shape and design representing a physical object based on an evolution strategy, comprising ~~the steps of~~ :

describing one of [[a]] the model, structure, shape and design representing the physical object to be optimized using a parameter set comprising object parameters;

creating offsprings of the parameter set by mutating of the object parameters and [[the]] a structure of [[a]] the parameter set, the structure of [[a]] the parameter set defined

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by [[the]] a number and position of the object parameters and [[the]] strategy

parameters; and

evaluating [[the]] quality of the offsprings;

wherein the parameter set comprises at least one strategy parameter representing [[the]] a

step-size of the mutation of associated object parameters.

13.   (currently amended)   The optimization method of claim 12, wherein said step-

size of the mutation is [[the]] a variance of [[the]] a normal distribution.

14.   (currently amended)   The optimization method of claim 12, wherein said one of

[[a]] the model, structure, shape, and design is described using a spline.

15.   (currently amended)   The optimization method of claim 14, wherein the object

parameters comprise control points and knot points, the method further comprising the step of:

adapting a knot vector by inserting new control points and strategy parameters.

16.   (currently amended)   The optimization method of claim 15, further comprising

the step of: estimating [[the]] values of newly inserted strategy parameters based upon [[the]]

values of [[the]] strategy parameters of neighboring control points.

17.   (currently amended)   A computer based method for optimizing a spline coded

problems structure on the basis of based on an evolution strategy, comprising the steps of :

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describing the spline coded structure ~~one of a model, structure, shape and design~~ to be

optimized using a parameter set comprising object parameters representing control

points and knot points and at least one strategy parameter representing [[the]] a

step-size of [[the]] a mutation of associated object parameters;

mutating the object parameters and [[the]] strategy parameters to create offsprings of the

set , comprising ~~having the steps of~~ :

determining a control point insertion,

inserting the control point in the parameter set,

inserting a strategy parameter for the inserted control point,

determining the knot points modified by the insertion of the control ~~points~~ point,

determining [[the]] a weighted averaging of [[the]] strategy parameter values of

[[the]] modified control points, and

assigning the weighted average value as [[the]] a value of the inserted strategy

parameter; and

evaluating [[the]] quality of the offsprings.

18.   (currently amended)   The method of claim 17, wherein said step-size of the

mutation is [[the]] a variance of [[the]] a normal distribution.

19.   (currently amended)   The method of claim [[17]] 1, wherein the model, structure,

shape and design representing the physical object ~~to optimize a shape of at least one of an~~

~~aerodynamic structure and a hydrodynamic structure.~~ comprises one of:

an airfoil;

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a spline coded structure;

a turbine blade for a gas turbine;

an aerodynamic structure; and

a hydrodynamic structure.

20.   (currently amended)   A computer program stored in a computer readable medium

for performing the method of claim [[17]] 1 .